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BARLOW, JOSEPHS & HOLMES, LTD.  
101 DYER STREET  
5TH FLOOR  
PROVIDENCE, RI 02903

EXAMINER

HAN, JASON

ART UNIT PAPER NUMBER

2875

DATE MAILED: 03/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

W.A

<b>Office Action Summary</b>	<b>Application No.</b> 10/731,392	<b>Applicant(s)</b> GALLI, ROBERT D.	
	<b>Examiner</b> Jason M. Han	<b>Art Unit</b> 2875	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 February 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Terminal Disclaimer***

1. The terminal disclaimer filed on February 22, 2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent 6827468 has been reviewed and is accepted. The terminal disclaimer has been recorded.

### ***Response to Arguments***

2. Applicant's arguments filed February 22, 2005 have been fully considered but they are not persuasive.

3. The prior art of Barnett et al. (U.S. Patent 6541800) in view of Luxeon® Power Light Sources (Non-Patent Literature cited in the Information Disclosure Statement of Parent Application 10/315,336) is commensurate to the scope of the claim.

4. In response to applicant's argument, "The Luxeon literature as provided by the Examiner specifically states that the printed circuit board is not a heat sink [*not actually stated by the examiner*] and that in order to light the LED, for more than a few seconds, an additional heat sinking means must be provided", is the motivation and corroboration the examiner used to add a heat sink [as shown in Figure 1B] to the Barnett reference.

5. In response to applicant's argument that "the Luxeon emitter were combined with Barnett by placing the LED into the Barnett device, the device would fail", the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the

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test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In this case, the examiner suggested adding the components of Luxeon, such as the heat transfer plate [Figure 1B: (T slug)] disposed on a rear side of a mounting base [Figure 1B: (Die attach)], as well as the MCPCB [Figure 1B] serving as a mounting die being electrically conductive and in thermal communication with said heat transfer plate, where the Barnett reference was deficient.

6. In response to applicant's argument, "Since the present invention clearly discloses the subject matter that is not found within either of the cited references Barnett or Luxeon either alone or in combination, the cited references cannot render the present invention obvious", the examiner again considers the prior art of record to be commensurate to the scope of the claim, wherein a broad interpretation has been construed by the examiner [MPEP 2111].

7. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case, Luxeon clearly teaches a thermal management system for an LED [see Title; Figure 1B].

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8. Therefore, the rejections of the last office action stand, and have been repeated below for the applicant's benefit.

- 
- The following claims have been rejected in light of the specification, but rendered the broadest interpretation [MPEP 2111]
  - Heat sink – as defined by the IEEE 100, "The Authoritative Dictionary of IEEE Standards Terms", Seventh Edition – a part that conducts and dissipates heat away from the pipe or equipment
  - Heat sink – as defined by Merriam-Webster's Collegiate Dictionary, Tenth Edition – a substance or device for the absorption or dissipation of unwanted heat (as from a process or an electronic device)
- 

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. (U.S. Patent 6541800) in view of Luxeon® Power Light Sources (Non-Patent Literature cited in the Information Disclosure Statement of Parent Application 10/315,336).

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10. With regards to Claim 1, Barnett teaches a lighting assembly [Figure 10] including a light emitting diode package [Figure 10: (10)], a mounting device [Figure 10: (254)], and a lens [Figure 10] received adjacent to the light emitting diode package. In addition, Barnett teaches the mounting device [Figure 10: (254)] having a first end and a second end opposite thereof, a longitudinal axis extending between the first and second ends, and an alignment guide on the first end that positions the light emitting diode package such that the central axis of the emitted light from the LED is substantially aligned with the longitudinal axis of the mounting device [Figure 10].

Barnett does not specifically teach a light emitting diode package having a heat transfer plate disposed on a rear side of a mounting base, nor teaches the mounting die being electrically conductive and in thermal communication with said heat transfer plate.

Luxeon® Power Light Sources teaches such a heat transfer plate [Figure 1B: (T slug)] disposed on a rear side of a mounting base [Figure 1B: (Die attach)]. It should be noted that applicant admits that the light emitting diode package may be a Luxeon® emitter. In addition, Luxeon® teaches, "All Luxeon products mounted on an aluminum, metal-core printed circuit board (MCPCB, also called Level 2 products) can be lit out of the box, though we do not recommend lighting the Flood for more than a few seconds without an additional heat sink... These products have 1 in<sup>2</sup> of MCPCB per emitter. The MCPCB acts as an electrical interconnect, as well as a thermal heat sink interface [Page 3]."

It would have been obvious to modify the lighting assembly of Barnett, specifically the mounting device, to incorporate the heat dissipation means of Luxeon®

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in order to ensure proper heat transfer for the LED, thus ensuring optimal performance. In addition, implementing an MCPCB to the mounting device of Barnett would further create a more compact device via elimination of electrical wiring.

11. With regards to Claim 2, Barnett in view of Luxeon® discloses the claimed invention as cited above. In addition, Barnett teaches an aperture [Figure 10: (254); Figure 1B] in the mounting die extending from the first end to the second end. Barnett further teaches a first contact lead [Figure 1B: (12) – anode] of a light emitting diode in electrical communication with the mounting die [Figure 1B: (54)] and a second contact lead [Figure 1B: (14) – cathode] of the light emitting diode extending into the aperture.

12. With regards to Claim 3, Barnett in view of Luxeon® discloses the claimed invention as cited above. In addition, Barnett teaches a circuit board [Figure 5: (40)] mounted adjacent to the second end of the mounting die, wherein the second contact lead of the light emitting diode is in electrical communication with the circuit board [Figure 5: (57, 58)]. It is apparent and obvious that a printed circuit board has circuit traces, hence the term “printed”.

13. With regards to Claim 7, Barnett in view of Luxeon® discloses the claimed invention as cited above. In addition, Barnett teaches an exterior enclosure having a tubular outer wall, wherein a cavity is formed for receiving and maintaining the mounting die, and whereby the light emitting diode and the lens are in assembled relation [Figure 10]. Barnett further teaches a power source [Figure 10: (battery)] having first and second contact leads providing electrical communication and power to the LED.

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14. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. (U.S. Patent 6541800) in view of Luxeon® Power Light Sources (Non-Patent Literature) as applied to Claim 3 above, and further in view of applicant's admitted prior art.

Barnett in view of Luxeon® discloses the claimed invention as cited above, but does not specifically teach the circuit board including control circuitry in electrical communication with the circuit traces.

To the applicant's admission, "control circuitry 40 may be mounted onto the flexible circuit strip 32 and housed within the channel 30 in the die 14. The control circuitry includes an LED driver circuit as is well known in the art [Page 15, last couple of sentences]."

It would have been obvious to modify the lighting assembly of Barnett with the heat dissipation means of Luxeon® to further incorporate the control circuitry of applicant's admitted prior art so as to provide an LED driver circuit to control a desired optical effect.

15. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. (U.S. Patent 6541800) in view of Luxeon® Power Light Sources (Non-Patent Literature) as applied to Claim 3 above, and further in view of Hochstein et al. (U.S. Patent 6582100).

Barnett in view of Luxeon® discloses the claimed invention as cited above. In addition, Barnett teaches an exterior enclosure having a tubular outer wall, wherein a cavity is formed for receiving and maintaining the mounting die, and whereby the light



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emitting diode and the lens are in assembled relation [Figure 10]. Barnett further teaches a power source [Figure 10: (battery)] having first and second contact leads providing electrical communication and power to the LED, but does not specifically teach the first contact lead in communication with the mounting die and the second contact lead in electrical communication with the circuit traces.

Hochstein teaches, "The assembly includes a plurality of light emitting diodes 20 and each LED 20 has electrical leads 22 for electrical contact with the traces 14 for powering the respective LEDs 20. In the preferred mode, the electrical leads 22 extend laterally or horizontally in opposite directions from opposite extremities of the LED 20 and overlie the traces 14. It is also possible, to use a single lead LED where the heat sink 54 is one of the electrical connections while the other lead constitutes the second electrical connection to a trace [Column 3, Lines 41-49; underlines added by examiner for emphasis]."

It would have been obvious to modify the lighting assembly of Barnett with the heat dissipation means of Luxeon® to further incorporate the electrical connection means of Hochstein in order to eliminate the need for a wire(s), and to ensure a proper electrical connection between the battery and light source. Such a configuration is an obvious design choice and commonly known within the art.

16. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. (U.S. Patent 6541800) in view of Luxeon® Power Light Sources (Non-Patent Literature) as applied to Claim 1 above, and further in view of Marhsall et al. (U.S. Patent 6547423).

Barnett in view of Luxeon® discloses the claimed invention as cited above, but does not specifically teach the lens including a total internal reflection collector portion.

Marshall discloses an LED collimation optics with improved performance and reduced size. Marshall teaches the collimator [Figure 1A: (20)] having a rear surface [Figure 1A: where the LED is disposed], an outer sidewall [Figure 1A: (7)], and a cavity [Figure 1A: (4)] defined by an inner sidewall [Figure 1A: (9)] and a front wall [Figure 1A: (8)] wherein an LED is disposed.

It would have been obvious to modify the lighting assembly of Barnett with the heat dissipation means of Luxeon® to further incorporate the collimator lens of Marshall in order to provide LED collimation optics in modifying the illumination with desired optical effect(s).

17. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. (U.S. Patent 6541800) in view of Luxeon® Power Light Sources (Non-Patent Literature), and further in view of Marshall et al. (U.S. Patent 6547423).

18. With regards to Claim 8, Barnett teaches a lighting assembly [Figure 10] with an exterior enclosure having a tubular outer wall, wherein a cavity is formed for receiving and maintaining a mounting device/die [Figure 10: (254)], and whereby a light emitting diode package [Figure 10: (10)] and a lens are in assembled relation [Figure 10].

Barnett specifically teaches the mounting device [Figure 10: (254)] having an aperture with a first end and a second end opposite thereof, a longitudinal axis extending between the first and second ends, and a recess defined on the first end that positions the light emitting diode package such that the central axis of the emitted light from the

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LED is substantially aligned with the longitudinal axis of the mounting device [Figure 10]. In addition, Barnett teaches a first contact lead [Figure 1B: (12) – anode] of a light emitting diode in electrical communication with the mounting die [Figure 1B: (54)] and a second contact lead [Figure 1B: (14) – cathode] of the light emitting diode extending into the aperture.

Barnett does not specifically teach a light emitting diode package having a heat transfer plate disposed on a rear side of a mounting base, whereby the mounting die is electrically conductive and in thermal communication with said heat transfer plate.

Luxeon® Power Light Sources teaches such a heat transfer plate [Figure 1B: (T slug)] disposed on a rear side of a mounting base [Figure 1: (Die attach)]. It should be noted that applicant admits that the light emitting diode package may be a Luxeon® emitter. In addition, Luxeon® teaches, “All Luxeon products mounted on an aluminum, metal-core printed circuit board (MCPCB, also called Level 2 products) can be lit out of the box, though we do not recommend lighting the Flood for more than a few seconds without an additional heat sink... These products have 1 in<sup>2</sup> of MCPCB per emitter. The MCPCB acts as an electrical interconnect, as well as a thermal heat sink interface [Page 3].”

Neither Barnett nor Luxeon® specifically teaches the lens including a total internal reflection collector portion.

Marshall discloses an LED collimation optics with improved performance and reduced size. Marshall teaches the collimator [Figure 1A: (20)] having a rear surface [Figure 1A: where the LED is disposed], an outer sidewall [Figure 1A: (7)], and a cavity

[Figure 1A: (4)] defined by an inner sidewall [Figure 1A: (9)] and a front wall [Figure 1A: (8)] wherein an LED is disposed.

It would have been obvious to modify the lighting assembly of Barnett, specifically the mounting device, to incorporate the heat dissipation means of Luxeon® in order to ensure proper heat transfer for the LED, thus ensuring optimal performance. In addition, implementing an MCPCB to the mounting device of Barnett would further create a more compact device via elimination of electrical wiring.

It would then have been advantageous and obvious to modify the lighting assembly of Barnett with the heat dissipation means of Luxeon® to further incorporate the collimator lens of Marshall in order to provide LED collimation optics in modifying the illumination with desired optical effect(s).

The above modifications provide a compact and efficient lighting assembly that is similar and commonly seen within a laser flashlight.

19. With regard to Claims 9-10, Barnett in view of Luxeon® discloses the claimed invention as cited above. In addition, Barnett teaches a circuit board [Figure 5: (40)] mounted adjacent to the second end of the mounting die, wherein the second contact lead of the light emitting diode is in electrical communication with the circuit board [Figure 5: (57, 58)]. It is apparent and obvious that a printed circuit board has circuit traces, hence the term "printed".

20. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. (U.S. Patent 6541800) in view of Luxeon® Power Light Sources (Non-Patent

Literature) and Marhsall et al. (U.S. Patent 6547423) as applied to Claim 10 above, and further in view of applicant's admitted prior art.

Barnett in view of Luxeon<sup>®</sup>, and further in view of Marshall discloses the claimed invention as cited above, but does not specifically teach the circuit board including control circuitry in electrical communication with the circuit traces.

To the applicant's admission, "control circuitry 40 may be mounted onto the flexible circuit strip 32 and housed within the channel 30 in the die 14. The control circuitry includes an LED driver circuit as is well known in the art [Page 15, last couple of sentences]."

It would have been obvious to modify the lighting assembly of Barnett with the heat dissipation means of Luxeon<sup>®</sup> and the lens of Marshall to further incorporate the control circuitry of applicant's admitted prior art so as to provide an LED driver circuit to control a desired optical effect.

21. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. (U.S. Patent 6541800) in view of Luxeon<sup>®</sup> Power Light Sources (Non-Patent Literature) and Marhsall et al. (U.S. Patent 6547423) as applied to Claim 8 above, and further in view of Hochstein et al. (U.S. Patent 6582100).

Barnett in view of Luxeon<sup>®</sup>, and further in view of Marshall discloses the claimed invention as cited above. In addition, Barnett teaches a power source [Figure 10: (battery)] having first and second contact leads providing electrical communication and power to the LED, but does not specifically teach the first contact lead in communication

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with the mounting die and the second contact lead in electrical communication with the circuit traces.

Hochstein teaches, "The assembly includes a plurality of light emitting diodes 20 and each LED 20 has electrical leads 22 for electrical contact with the traces 14 for powering the respective LEDs 20. In the preferred mode, the electrical leads 22 extend laterally or horizontally in opposite directions from opposite extremities of the LED 20 and overlie the traces 14. It is also possible, to use a single lead LED where the heat sink 54 is one of the electrical connections while the other lead constitutes the second electrical connection to a trace [Column 3, Lines 41-49; underlines added by examiner for emphasis]."

It would have been obvious to modify the lighting assembly of Barnett with the heat dissipation means of Luxeon® and the lens of Marshall to further incorporate the electrical connection means of Hochstein in order to eliminate the need for a wire(s), and to ensure a proper electrical connection between the battery and light source. Such a configuration is an obvious design choice and commonly known within the art.

22. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. (U.S. Patent 6541800) in view of Hochstein et al. (U.S. Patent 6582100), and further in view of Marshall et al. (U.S. Patent 6547423).

23. With regard to Claims 13 and 15, Barnett teaches a lighting assembly [Figure 10] with an exterior enclosure having a tubular outer wall, wherein a cavity is formed for receiving and maintaining a mounting device/die [Figure 10: (254)], and whereby a light emitting diode package [Figure 10: (10)] and a lens are in assembled relation [Figure

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10]. Barnett specifically teaches the mounting device [Figure 10: (254)] having an aperture with a first end and a second end opposite thereof, a longitudinal axis extending between the first and second ends, and an alignment guide on the first end that positions the light emitting diode package such that the light emitting diode extends through the aperture and such that the central axis of the light emitting diode is substantially aligned with the longitudinal axis of the mounting device [Figure 10].

Barnett does not specifically teach a light emitting diode package having a heat transfer plate disposed on a rear side of a mounting base, nor the mounting die acting (including) as a heat sink assembly in thermal communication with said heat transfer plate.

Hochstein discloses an LED mounting system wherein the LED has a front luminescent portion [Figures 1-2: (39)]; a mounting base [Figures 1-2: (20)] having a heat transfer plate [Figures 1-2: (54)] located on a rear surface thereof and first and second contact leads [Figures 1-2: (22, 24)] extending from the sides thereof; a heat dissipater [Figures 1-2: (10)] having a recess to receive the mounting base [Figures 1-2: (40)], a rear surface [Column 3, Lines 33-36], and whereby the heat dissipater is in thermal communication with the heat transfer plate and a spreader plate [Figures 1-2: (52)] that retains (commonly seen in the art as cited below) and conducts heat from the LED to the rear surface of the heat dissipater.

Neither Barnett nor Hochstein specifically teaches the lens including a total internal reflection collector portion.

Marshall discloses an LED collimation optics with improved performance and reduced size. Marshall teaches the collimator [Figure 1A: (20)] having a rear surface [Figure 1A: where the LED is disposed], an outer sidewall [Figure 1A: (7)], and a cavity [Figure 1A: (4)] defined by an inner sidewall [Figure 1A: (9)] and a front wall [Figure 1A: (8)] wherein an LED is disposed.

It would have been obvious to modify the lighting assembly of Barnett, specifically the mounting device, to incorporate the heat dissipation means of Hochstein in order to ensure proper heat transfer for the LED, thus ensuring optimal performance.

It would then have been advantageous and obvious to modify the lighting assembly of Barnett with the heat dissipation means of Hochstein to further incorporate the collimator lens of Marshall in order to provide LED collimation optics in modifying the illumination with desired optical effect(s).

The above modifications provide an efficient lighting assembly that is similar and commonly seen within a laser flashlight.

24. With regards to Claim 14, Hochstein teaches a circuit board/insulating layer [Figures 1-2: (12)] proximately adjacent to the spreader plate and having circuit traces [Figures 1-2: (14)] in electrical communication with the contact leads [Figures 1-2: (22)] of the LED [Column 3, Lines 41-44].

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Han whose telephone number is (571) 272-2207. The examiner can normally be reached on 8:00am-5:00pm.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (571) 272-2378. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMH (3/18/2005)



Sandra O'Shea  
Supervisory Patent Examiner  
Technology Center 2800